

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended) A method for improving communication throughout a network, the network including a module capable of transmitting messages in response to a change of state, the method comprising:

detecting an error;  
calculating a raw bit error rate;  
correlating a residual error probability in response to the detected error rate; and  
based on the residual error probability, retransmitting a first type of messages and shortening the length of the first type of messages, without at least one of retransmitting and shortening the length of a second type of messages.  
~~executing a corrective action related to transmitting messages, the execution being activated in response to the residual error probability, wherein executing the corrective action comprises regularly executing the corrective action on all of at least one type of the messages, without executing the corrective action on another type of the messages.~~

2. (Currently Amended) The method of claim 1 wherein ~~executing a corrective action comprises retransmitting a message wherein redundant~~ the retransmissions occur at a rate sufficient to bound the residual errors to a predetermined threshold.

3. (Canceled)

4. (Currently Amended) The method of claim 1 further comprising ~~wherein executing a corrective action comprises~~ ceasing transmission of one of the first and second types of messages. ~~the message.~~

5. (Original) The method of claim 1 wherein correlating a residual error probability utilizes maximum-likelihood filtering.

6. (Original) The method of claim 5 wherein the maximum-likelihood filtering utilizes Kalman filtering.

7. (Previously Amended) The method of claim 1 wherein correlating a residual error probability utilizes rate of deterioration.

8. (Currently Amended) The method of claim 1 wherein detecting the error utilizes a packet identifier, ~~PID; PID is a code used for identifying of the components that forms a particular service in the transmitted datastream.~~

9. – 16. (Withdrawn)

17. (Currently Amended) An apparatus for reducing the effect of undetected communication errors transmitted throughout a network, the network having a module and being configured such that messages are transmitted from the module in response to a change of state of the module, the apparatus comprising:

means for determining an undetected bit error probability; and,

means for improving accurate message transmission being responsive to the means for determining an undetected bit error probability wherein undetected bit errors transmitted throughout the network are bound to a predetermined threshold, and wherein the means for improving accurate message transmission comprises means for retransmitting a first type of messages and shortening the length of the first type of messages, without at least one of retransmitting and shortening the length of a second type of messages. ~~regularly executing a corrective action on all of at least one type of the messages, without executing the corrective action on another type of the messages.~~

18. (Original) The apparatus of claim 17 further comprising means for determining a detected bit error rate.

19. (Original) The apparatus of claim 18 wherein the means for determining a detected bit error rate comprises: a bit error monitor for detecting bit errors; a counter being operably responsive to the monitor, the counter being capable of tallying an amount of detected bit errors; and, a calculator being operably connected to the counter, the calculator being capable of determining a detected bit error rate in response to the amount of detected bit errors.

20. (Original) The apparatus of claim 19 wherein the means for determining an undetected bit error probability comprises: an extrapolator for correlating an undetected bit error probability in response to the determined detected bit error rate.

21. (Original) The apparatus of claim 17 further comprising: a corrective action flag, the corrective action flag being set in response to the undetected bit error probability exceeding a predetermined threshold.

22. (Original) The apparatus of claim 17 wherein the means for improving accurate message transmission comprises: a message repeater for repetitively transmitting messages throughout the network in response to a change of state and at a rate sufficient to bound the undetected errors to a predetermined threshold.

23. (Canceled)

24. (Original) The apparatus of claim 17 wherein the means for improving accurate message transmission comprises: a message transmission terminator for ceasing transmission of network messages.

25. (Original) The apparatus of claim 17 further comprising: a maximum-likelihood filter being operably connected to the extrapolator.

26. (Original) The apparatus of claim 25 wherein the maximum-likelihood filter is a Kalman filter.

27. (Original) The apparatus of claim 17 further comprising: a differentiator being operably connected to the extrapolator for determining the first derivative of the calculated detected bit error rate.

28. (Original) The apparatus of claim 17 further comprising: a packet identifier, the packet identifier being a portion of the message and being utilized by the bit error detector for detecting a message having an error.

29. – 36. (Withdrawn)

37. (Currently Amended) A medium readable by a device being operably connected within a CAN network having a bus master and an I/O module operably coupled to a communication bus wherein the I/O module is subject to a state change, the medium containing instructions for improving network communication by reducing the effect of undetected errors, the medium comprising:

- a first segment for detecting an error;
- a second segment for calculating a bit error rate;
- a third segment for correlating an undetected error probability in response to the detected error rate; and

- a fourth segment for executing a corrective action to improve message transmission throughout the network, the execution being activated in response to the undetected error probability and the change of state of the I/O module, and wherein the corrective action comprises regularly executing the corrective action on all of ~~at least one~~ a first type of ~~the~~ messages, without executing the corrective action on ~~another~~ a second type of ~~the~~ messages.

38. (Previously Amended) The medium of claim 37 wherein the fourth segment retransmits a message wherein redundant transmissions occur at a rate sufficient to bound the residual errors to a predetermined threshold.

39. (Previously Amended) The medium of claim 37 wherein the fourth segment shortens the length of the transmitted message.

40. (Previously Amended) The medium of claim 37 wherein the fourth segment ceases module messages transmissions.

41. (Previously Amended) The medium of claim 37 wherein the third segment utilizes maximum-likelihood filtering.

42. (Previously Amended) The medium of claim 41 wherein the maximum-likelihood filtering utilizes Kalman filtering.

43. (Previously Amended) The medium of claim 37 wherein the third segment utilizes rate of deterioration of the calculated bit error rate.

44. (Previously Amended) The medium of claim 37 wherein the first segment utilizes a packet identifier.